



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

649.4813

Job Sheet 171213



Part No: 649.4813

Job Qty: 5 ea

Part Name: Shim



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 1/30/18

Job Tracking No:

Due Date: 2/28/18

Created By: Michelle Gagnon-Donovan

Type: Stock

Description:

Note: 649.4800 REV.D1 IPP REV:A 12.11.01 NEW ISSUE DD VERF:JLM IPP REV:B 17.10.18 AS PER DWG REV.D DD VERF:JFS

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	5 Ea	2/27/18	2/27/18	0.00	0.00	Start Up Waterjet		pc 18/02/12
110	Waterjet	5 pcs	2/27/18	2/27/18	0.00	0.15	Waterjet1		pc 18/02/12
120	QC	5 pcs	2/27/18	2/27/18	0.00	0.00	QC2 Waterjet-1		pc 18/02/12
130	QC	5 pcs	2/27/18	2/27/18	0.00	0.00	QC8-1		25
140	Small Fab	5 pcs	2/28/18	2/28/18	0.00	0.31	Small Fab-1		
150	QC	5 pcs	2/28/18	2/28/18	0.00	0.00	QC5		
160	Outsource	5 pcs	2/28/18	2/28/18			ATG001-VC		
170	Packaging	5 pcs	2/28/18	2/28/18	0.00	0.00	Packaging2		
180	QC	5 pcs	2/28/18	2/28/18	0.00	0.00	QC5		
210	Packaging	5 pcs	2/28/18	2/28/18	0.00	0.00	Packaging3-1		
220	QC21-SA	5 Ea	2/28/18	2/28/18	0.00	0.00	QC21	18.03.19(12)	

Part Op 110 - 1-Cut as per Dwg Dwg Rev: D Prog Rev: D 2-Deburr if necessary
 Descriptions: 140 - FORM AS PER DWG USE DT9855
 160 - ISSUE P/O: As Per MPP-172 Section 2.1, Hard Anodize IAW MIL-A-8625, Type III, Class 2, Color Black As Per MPP-172 Section 4.2 Prime IAW MIL-P-23377J Type1 Class N
 210 - ***IDENTIFY AS PER APICAL MPP-120 BY STAMPING P# AND REV***

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
M2024T3S.125	2024-T3 .125 Sheet	.1425 sf (.0285 ea)	90-Start up Operation	

Job Allocations

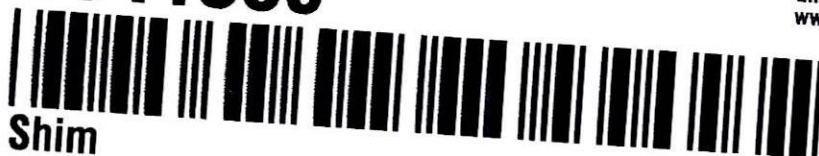
Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	M2024T3S.125	0	92	0

Part Specifications

Specifications could not be found.

Plex 1/31/18 10:12 AM Dart.Gagnon.Michelle

DART
AEROSPACE
S041389



Shim

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K64 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

PART NO: 649.4813
Original Serial #: S041389
Revision:
Operation:
Change No:

Start up Operation

02/12/18
Job No: 171213

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

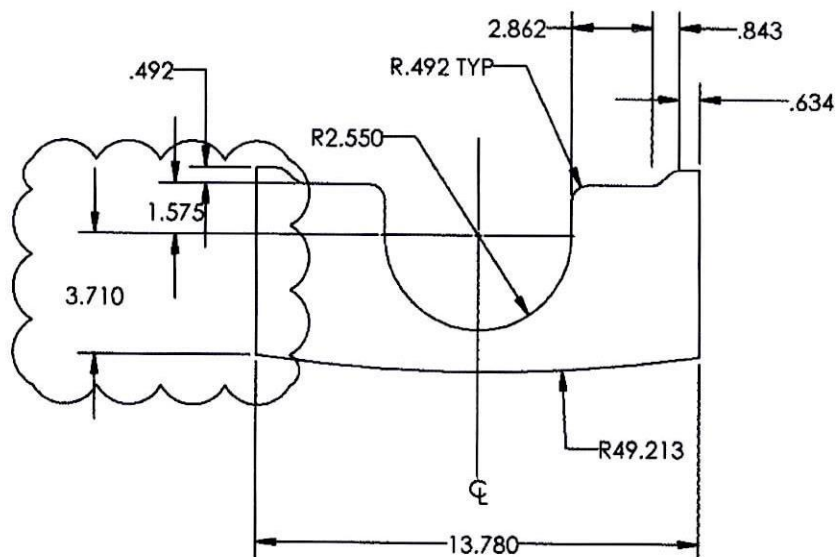
Work Order: <u>171213</u> Part No. <u>649.4313</u> NCR No. _____		DISPOSITION Rework ☐ Scrap ☒ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube ☐</td> <td style="width:15%;">Cross tube ☐</td> <td style="width:15%;">Water Jet ☐</td> <td style="width:15%;">Engineering ☒</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☒	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
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Large Fab ☐	Composite ☐	Supplier ☐																							
Date : <u>18-03-19</u>		Step #: <u>130</u>		QTY Effective : <u>6</u>		MRB (QSI042) Approval <u>PD 18-03-19</u>																			
Description Work Order Deviation				Disposition																					
<u>part got revised under ECN 13-646</u>				<u>Scrap destroy.</u>																					
				Completed By 																					
				Lead hand / Supervisor Approval Verification 																					
				QC / QA Coordinator Approval <u>PD 18-3-19</u>																					
Root Cause <table style="width:100%; border: none;"> <tr> <td style="width:50%;"> Environment ☐ Design ☒ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ </td> <td style="width:50%;"> No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐ </td> </tr> </table>				Environment ☐ Design ☒ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	FAULT CATEGORY <table style="width:100%; border: none;"> <tr> <td style="width:33%;"> Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ </td> <td style="width:33%;"> Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ </td> <td style="width:33%;"> Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ </td> <td style="width:33%;"> Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ ☒ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐ </td> </tr> </table>				Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ ☒ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐												
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				OTHER : _____																					



APICAL INDUSTRIES, INC.
dba DART AEROSPACE

ENGINEERING CHANGE NOTICE NO.		05878		SHEET 1 OF 1									
DWG NO.	649.4800	REV:	D	PREPARED BY	J. BECKER	DATE:	11/21/17	EFFECT ON DWG ☐ INC. ☒ UNINC.					
DWG TITLE:		SHEETMETAL											
APPROVED BY:	ENGR			MFG			QC			EFF.	CURRENT ORDER		
TRANSACTION CODES (TC): A-ADD C-CREATE R-REVISE D-DELETE										REASON: REVISED DIMENSION OF DOUBLER.		ECR:	N/A

SHEET 5, ZONE C1 IS:



SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 171213
JAN 31 2018

F/N	TC	PART NUMBER	QTY	DESCRIPTION	MATERIAL	SPECIFICATION	
DOCUMENTS EFFECTED:				CHANGE CATEGORY			DER REVIEW REQUIRED
☐ PATTERN ☐ MDL ☐ INSTALL INSTRUCTIONS ☐ ICA ☐ FMS ☐ BOM				☐ MAJOR ☒ MINOR		☐ YES ☒ NO	

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NOTES: UNLESS OTHERWISE SPECIFIED

1 MATERIAL: ALUMINUM 2024-T3 PER AMS-QQ-A-250/4

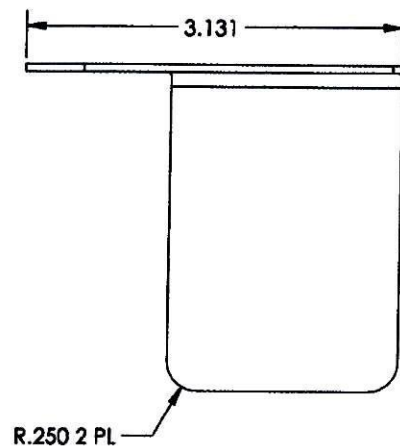
2 FINISH: HARD ANODIZE IAW MIL-A-8625 TYPE III, CLASS 2, COLOR BLACK;
PRETREAT PR-148 ADHESION PROMOTER, PRIME IAW MIL-P-23377J, TYPE I, CLASS N

3. DEBURR AND BREAK ALL SHARP EDGES

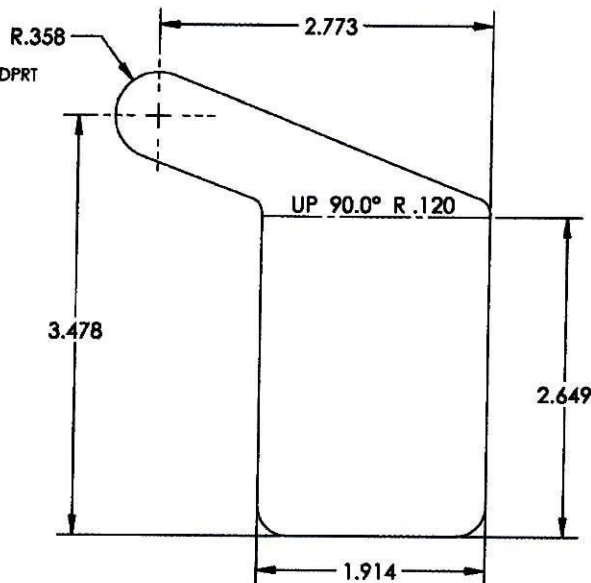
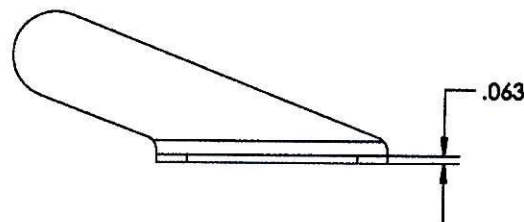
4. IDENTIFY IAW MPP-120. LASER ETCH P/N AND REVISION 12PT. CENTURY GOTHIC.

5 PART DIMENSIONS CONTROLLED BY CAD MODEL; FILE NAME: 649.4816 DOUBLER.SLDPR

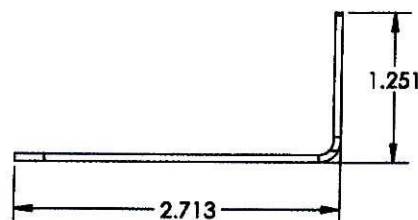
6. INSPECTION DIMENSIONS SHOWN WITH FINISH APPROX. 3-5 MIL MAX PER FACE.



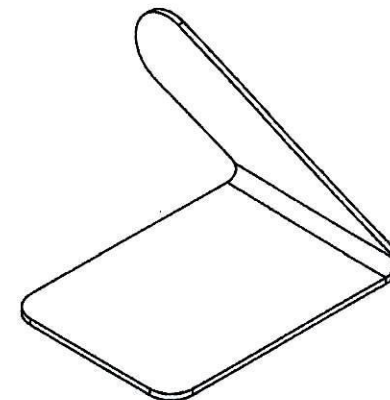
R.250 2 PL



649.4811
FLAT PATTERN



REV.	DESCRIPTION	DATE	APPROVED
1	LAST PROTOTYPE REVISION PER		
2	MATERIAL RELEASE	11-09-11	P. BRAVO
3	INCORPORATED ECN 05075	04-11-12	P. BRAVO
4	INCORPORATED ECN 05802	07-09-14	P. BRAVO
5	INCORPORATED ECN 05801	07-04-17	P. BRAVO
6	INCORPORATED ECN 05848, 05854	09-11-17	P. BRAVO



649.4811

UNINCORPORATED ECN(S)

05075

QTY	FIND #	PART #	DESCRIPTION	MAT'L	SPEC.
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10		649.4819	SHIM	△	△
9		649.4818	SHIM	△	△
8		649.4817	SHIM	△	△
7		649.4816	DOUBLER	△	△
6		649.4815	SHIM	△	△
5		649.4814	DOUBLER	△	△
4		649.4813	SHIM	△	△
3		649.4812	SHIM	△	△
2		649.4811	CLIP	△	△
1			DELETED		

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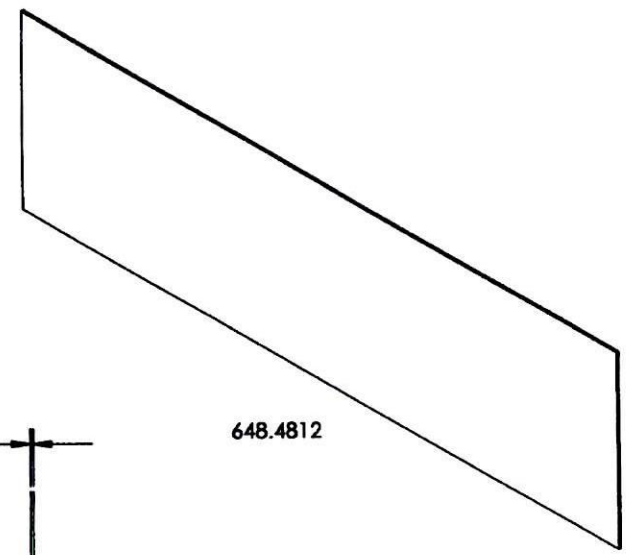
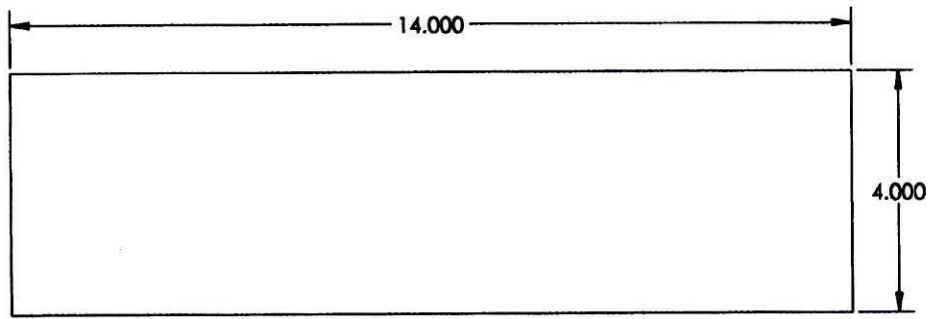
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5		649.4814	DOUBLER	△	△
4		649.4813	SHIM	△	△
3		649.4812	SHIM	△	△
2		649.4811	CLIP	△	△
1			DELETED		

QTY	FIND #	PART #	DESCRIPTION	MAT'L	SPEC.
11		649.4820	SHIM	△	△
10		649.4819	SHIM	△	△
9		649.4818	SHIM	△	△
8		649.4817	SHIM	△	△
7		649.4816	DOUBLER	△	△
6		649.4815	SHIM	△	△
5		649.4814	DOUBLER	△	△
4		649.4813	SHIM	△	△
3		649.4812	SHIM	△	△
2		649.4811	CLIP	△	△
1			DELETED		

QTY	FIND #	PART #	DESCRIPTION	MAT'L	SPEC.
11		649.4820	SHIM	△	△
10		649.4819	SHIM	△	△
9		649.4818	SHIM	△	△
8		649.4817	SHIM	△	△
7		649.4816	DOUBLER	△	△
6		649.4815	SHIM	△	△
5		649.4814	DOUBLER	△	△
4		649.4813	SHIM	△	△
3		649.4812	SHIM	△	△
2		649.4811	CLIP	△	△
1			DELETED		

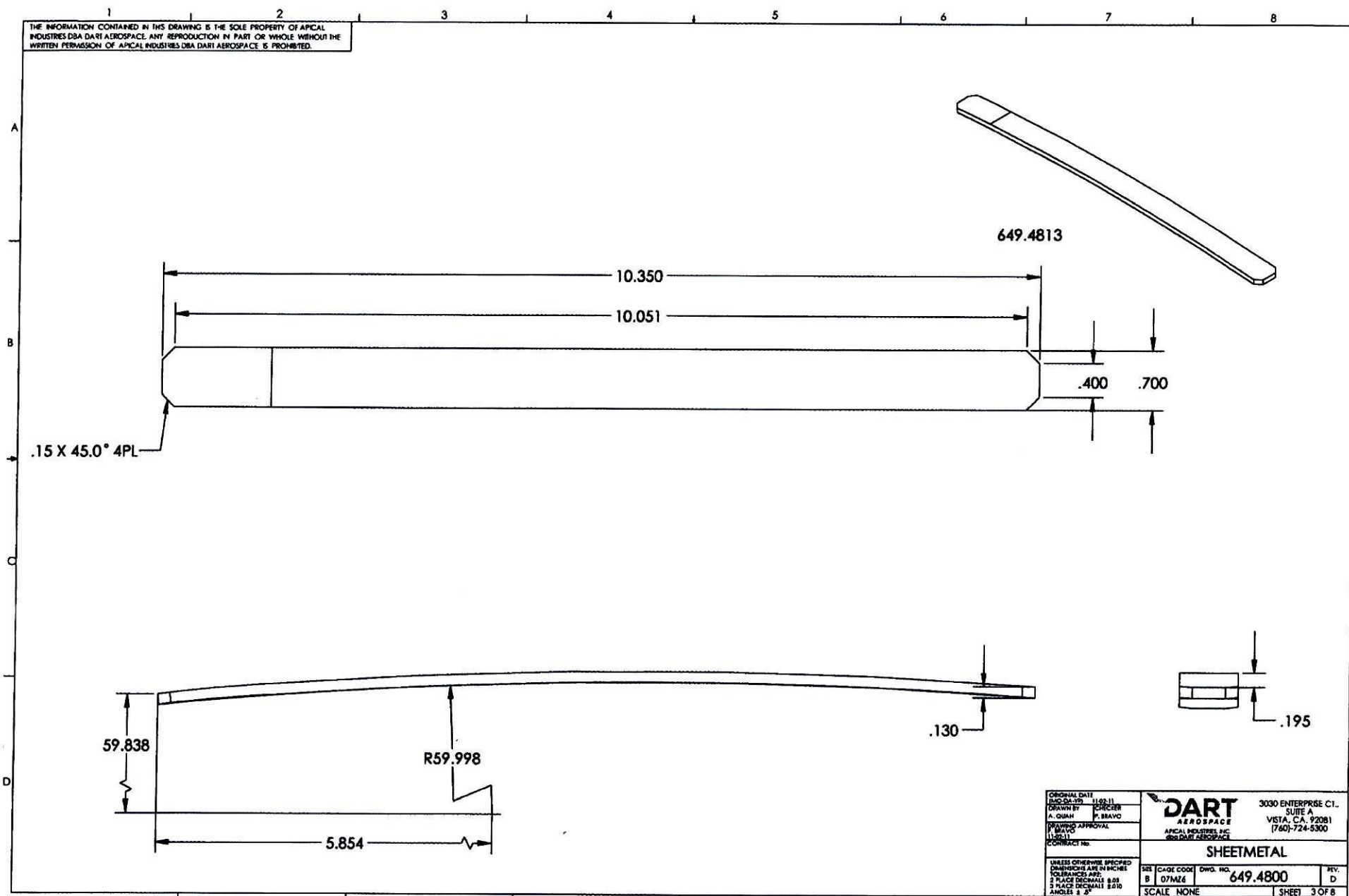
QTY		PARTS LIST	
NEXT ASSY (S)		 3030 ENTERPRISE CT., SUITE A VISTA, CA. 92081 (760)-724-5300	
649.4700		DRWING BY: A. QUINN CHECKED BY: P. MARVO DESIGNED BY: J. BAYCO APPROVED BY: J. BAYCO CONTRACT NO.	
ORIGINAL DATE: 06/05/11 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 1. PLACI DECIMALS ±.005 2. PLACI DECIMALS ±.010 3. ANGLES ±.2°		SHEETMETAL 649.4800	
BIL. CAT. CODE NO. DWG. NO. REV. D 8 07/24/62 649.4800		SCALE NONE SHEET 1 OF 8	

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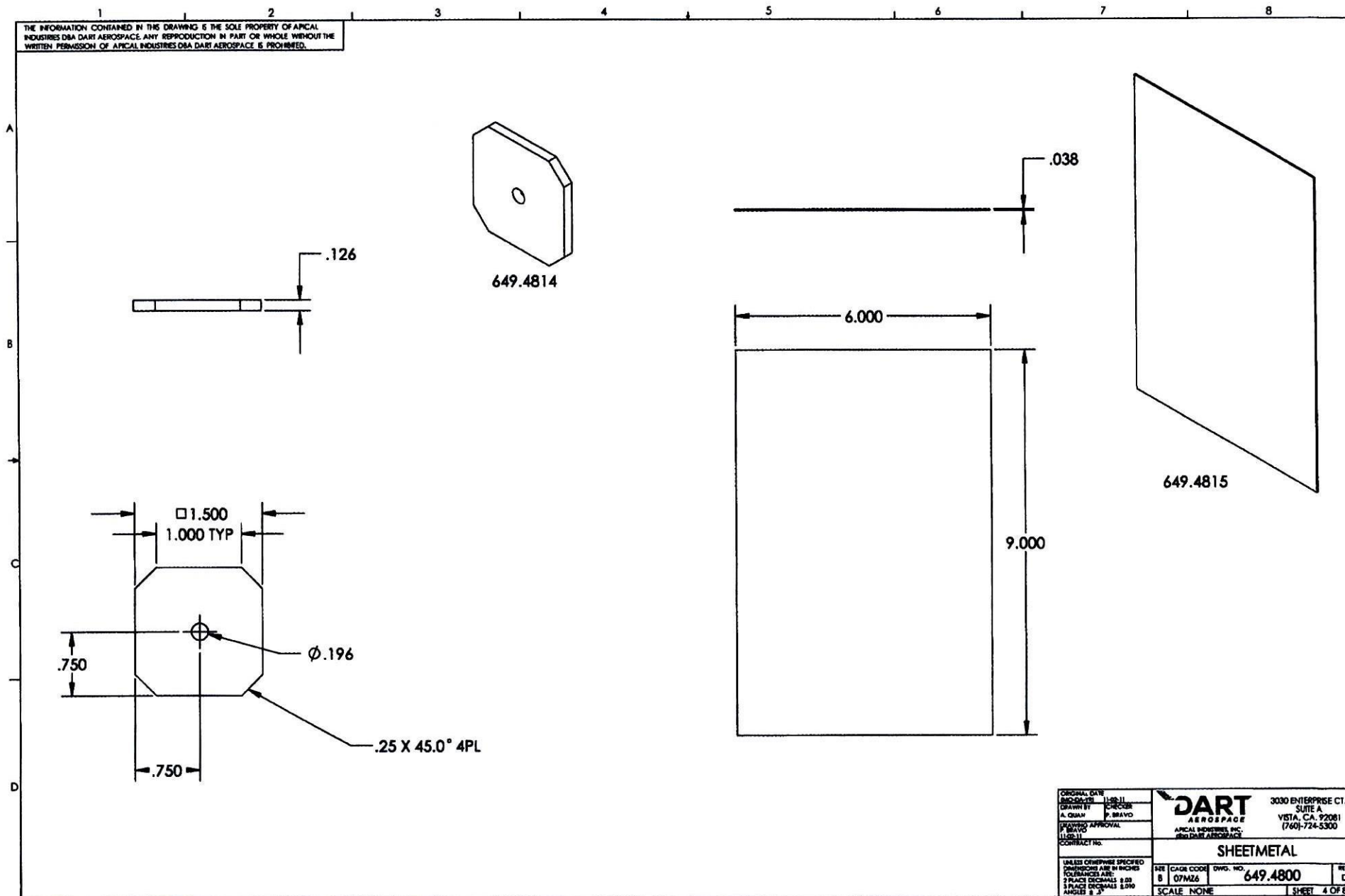


ORIGINAL DATE 1/20/11		3030 ENTERPRISE CT., SUITE A VISTA, CA 92081 (760)-724-5300	
DRAWN BY A. QUAN		CHECKED BY P. BRAVO	
DRAWING APPROVAL (1/20/11)		APICAL INDUSTRIES, INC. DBA DART AEROSPACE	
CONTRACT NO.		SHEETMETAL	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 2 PLACE DECIMALS ±.005 3 PLACE DECIMALS ±.010 ANGLES ± 5°		REV. NO. B 07/MZ6	REV. NO. D
SCALE NONE		SHEET 2 OF 8	

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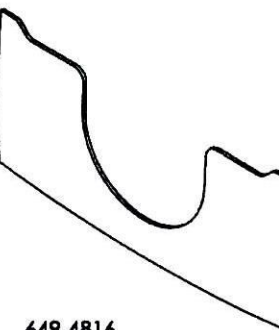


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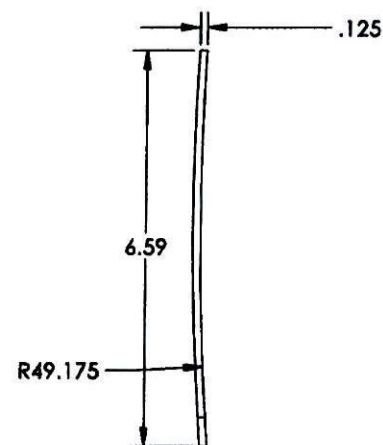
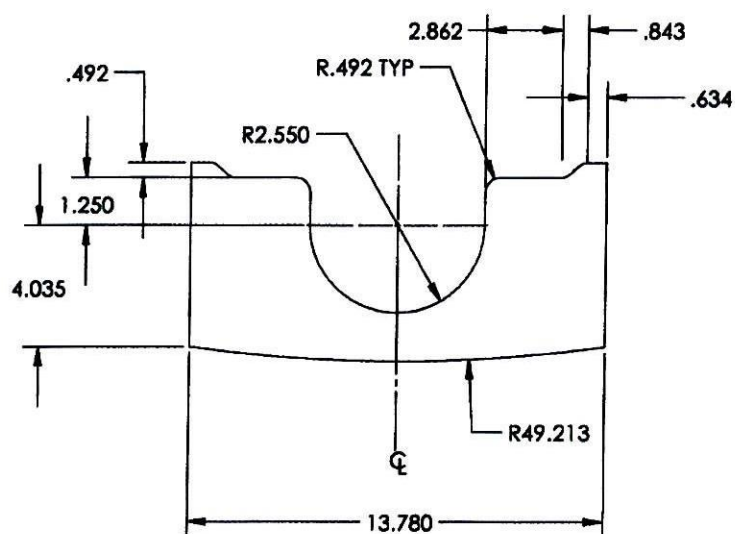


ORIGINAL DATE (11/01/11)		3030 ENTERPRISE CT., SUITE A, VISTA, CA, 92081 (760)-724-5300	
DRAWN BY A. QUAN		DART AEROSPACE	
CHECKED BY P. BRAVO		APICAL INDUSTRIES, INC. DBA DART AEROSPACE	
DRAWING APPROVAL P. BRAVO (11/01/11)		SHEETMETAL	
CONTRACT NO.		REV. D	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 2 PLACE DECIMALS ± .02 3 PLACE DECIMALS ± .010 ANGLES ± .5°		REV. 8	SCALE NONE
DWG. NO. 649.4800		SHEET 4 OF 8	

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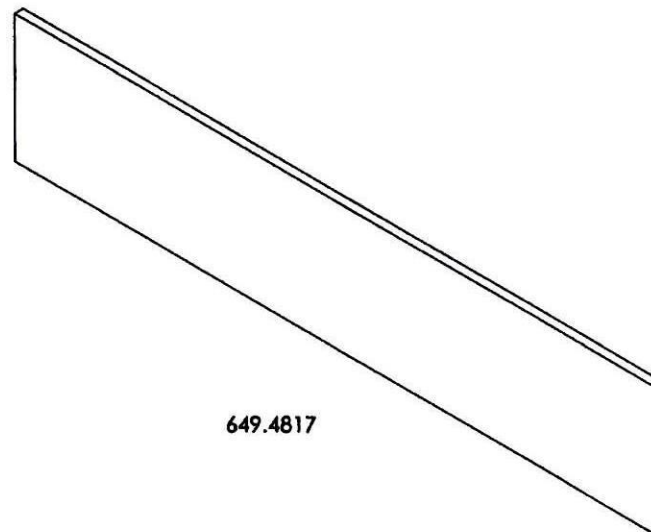


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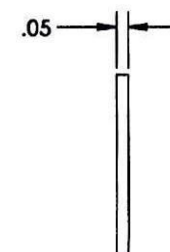
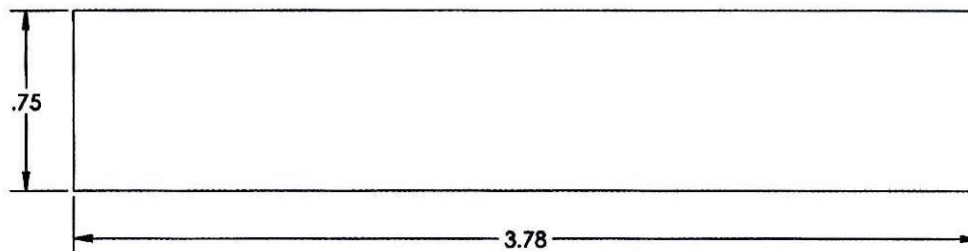


ORIGINAL DATE 11-02-11		3030 ENTERPRISE CT., SUITE A VISTA, CA 92081 (760)-724-5300	
DRAWN BY A. GUAN		P. BRAVO	
DRAWING APPROVAL P. BRAVO (11/02/11)		APICAL INDUSTRIES INC. DBA DART AEROSPACE	
CONTRACT NO.		SHEETMETAL	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 3 PLACES DECIMALS .001 2 PLACES DECIMALS .010 ANGLES ± .5°		REV B	D
CAGE CODE 07M26		DWG. NO. 649.4800	
SCALE NONE		1 SHEET 5 OF 8	

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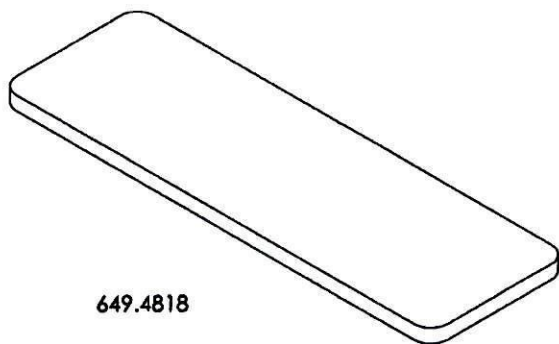


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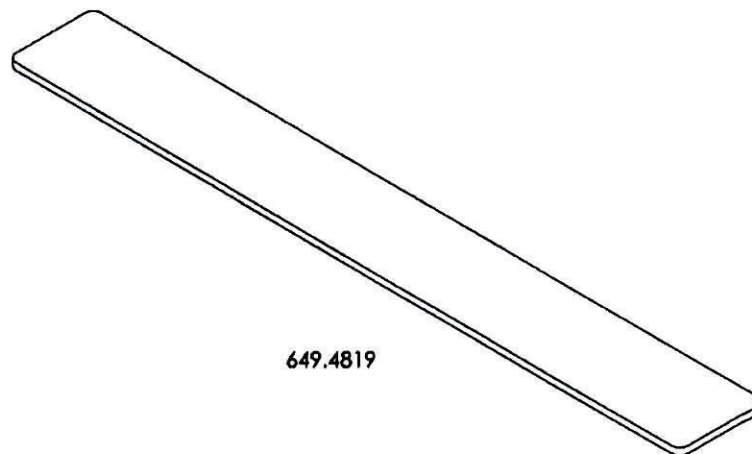


ORIGINAL DATE 11/22/11		3030 ENTERPRISE CT., SUITE A VISTA, CA. 92081 (760)-724-5300	
DRAWN BY A. GUAN	CHECKED P. BRAVO	SHEETMETAL	
DRAWING APPROVAL P. BRAVO 11/22/11			
CONTRACT NO.		REV. CAGE CODE B 07M26	DWG. NO. 649.4800
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 3 PLACE DECIMALS ± .01 ANGLES ± .5°		SCALE NONE	REV. D SHEET 6 OF 8

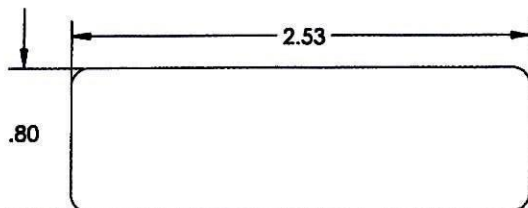
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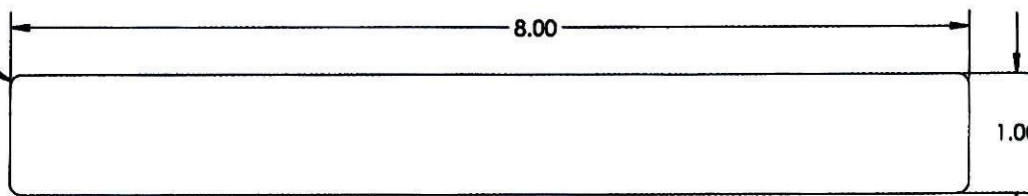
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649.4819

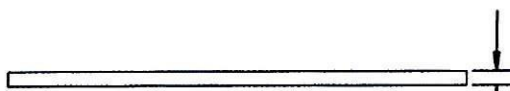


R.10



1.00

R.10



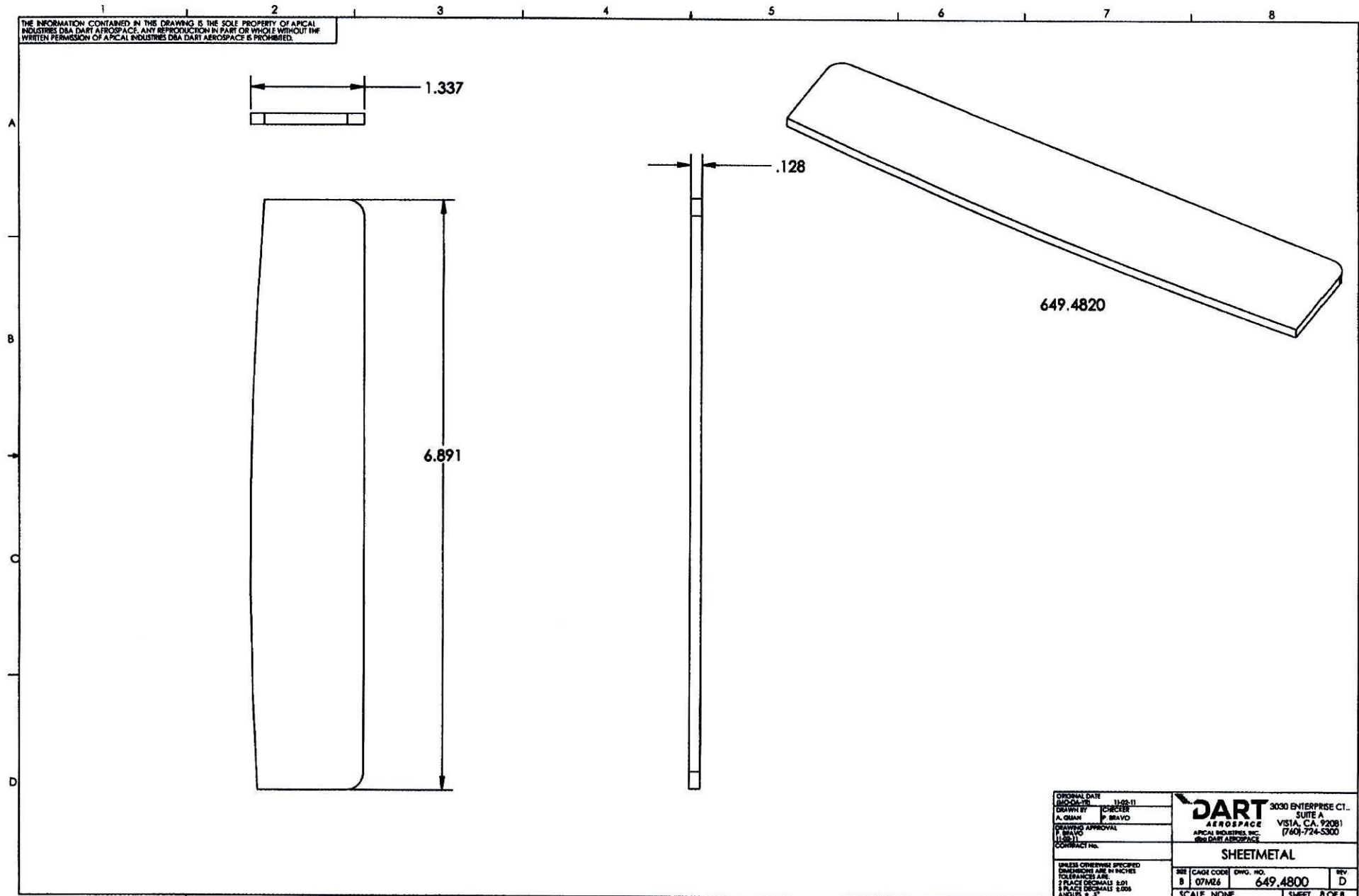
.080



.080

ORIGINAL DATE 11-05-11		3030 ENTERPRISE CT. SUITE A VISTA, CA 92081 (760)-724-5300	
DRAWN BY A. CHAN		P. BRAYO	
DRAWING APPROVAL P. BRAYO		APICAL INDUSTRIES INC. DBA DART AEROSPACE	
CONTRACT NO.		SHEETMETAL	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 3 PLACE DECIMALS .000 2 PLACE DECIMALS .000 ANGLES 9.0°		REV D	REV D
SCALE NONE		SHEET 7 OF 8	

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ORIGINAL DATE 11-09-11	3030 ENTERPRISE CT., SUITE A VISTA, CA 92081 (760)-724-5300		
DRAWN BY A. QIAN	CHECKED P. BRAVO	APICAL INDUSTRIES, INC. DBA DART AEROSPACE	
DRAWING APPROVAL P. BRAVO 11-09-11		SHEETMETAL	
CONTRACT NO.		SCALE NONE	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 2 PLACE DECIMALS ±.01 3 PLACE DECIMALS ±.005 ANGLES ± .3°		SHEET / CASE CODE 8 / 07M26	REV. D
		649.4800	
		SHEET 8 OF 8	

— 2 —

INSPECTION SHEET

[illegible]

Measured by:	<i>ac</i>	Checked by:	<i>EB</i>	QC Inspector:	
Date:	<i>18/02/12</i>	Date:	<i>FEB 13 2018</i>	Date:	

Engineering Approval: (If necessary)		Date:	
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Rev	Date	Change	Revised by	Approved
A	14.07.31	New Issue	KJ	

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER :					